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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,445	10/29/2003	Jean X. Morin	EVT/134/US	5966
2543	7590	04/14/2004	EXAMINER	
ALIX YALE & RISTAS LLP 750 MAIN STREET SUITE 1400 HARTFORD, CT 06103			RINEHART, KENNETH	
			ART UNIT	PAPER NUMBER
			3749	

DATE MAILED: 04/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/696,445

Applicant(s)

MORIN ET AL.

Examiner

Kenneth B Rinehart

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 6-11 is/are rejected.
- 7) ☒ Claim(s) 3-5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 10/696,445.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/29/03.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Shearer et al. Shearer et al shows Apparatus for the cleaning of flue gases containing ash and sulfur dioxide produced by burning sulfur-containing coal in the combustion chamber of a circulating fluidized-bed firing system by the addition of air at a temperature of 700 to 950C (50, fig. 1), the apparatus comprising: means for delivering a particulate SO<sub>2</sub> sorbent into the combustion chamber (52, fig. 1), a portion of the SO<sub>2</sub> sorbent and SO<sub>2</sub> producing a reaction product, a portion of the SO<sub>2</sub> sorbent remaining unreacted (col. 4, lines 57-61); a mixing unit (60, fig. 1);, means for feeding a mixture comprising a portion of the ash, a portion of the reaction product, and a portion of the unreacted SO<sub>2</sub> sorbent from the combustion chamber to the mixing unit (61, fig. 1); means for supplying water or an aqueous sodium-containing solution to the mixing unit (63, fig. 1), the water or aqueous sodium-containing solution mixing together with the mixture of ash, reaction product, and unreacted SO<sub>2</sub> sorbent at a reaction temperature of 60 to 100 and at atmospheric pressure, whereby the unreacted SO<sub>2</sub> sorbent is converted into a hydration product (col. 5. line 47); and means for returning the ash, the reaction product, and the hydration product from the mixing unit into the combustion chamber; wherein in the combustion chamber the hydration

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product is reactivated into an SO<sub>2</sub> sorbent at a combustion temperature of 700 to 950 C (67, 68, fig. 1, col. 3, line 60).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 6, 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shearer in view of Chughati et al. Shearer discloses Apparatus for the cleaning of flue gases containing ash and sulfur dioxide produced by burning sulfur-containing coal in the combustion chamber of a circulating fluidized-bed firing system by the addition of air at a temperature of 700 to 950C (50, fig. 1), the apparatus comprising: means for delivering a particulate SO<sub>2</sub> sorbent into the combustion chamber (52, fig. 1), a portion of the SO<sub>2</sub> sorbent and SO<sub>2</sub> producing a reaction product, a portion of the SO<sub>2</sub> sorbent remaining unreacted (col. 4, lines 57-61); a mixing unit (60, fig. 1);, means for feeding a mixture comprising a portion of the ash, a portion of the reaction product, and a portion of the unreacted SO<sub>2</sub> sorbent from the combustion chamber to the mixing unit (61, fig. 1); means for supplying water or an aqueous sodium-containing solution to the mixing unit (63, fig. 1), the water or aqueous sodium-containing solution mixing together with the mixture of ash, reaction product, and unreacted SO<sub>2</sub> sorbent at a reaction temperature of 60 to 100 and at atmospheric pressure, whereby the unreacted SO<sub>2</sub> sorbent is converted into a hydration product (col. 5. line 47); and means for returning the ash, the reaction product, and the

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hydration product from the mixing unit into the combustion chamber; wherein in the combustion chamber the hydration product is reactivated into an SO<sub>2</sub> sorbent at a combustion temperature of 700 to 950 C (67, 68, fig. 1, col. 3, line 60). Shearer et al discloses applicant's invention substantially as claimed with the exception of means for supplying water or for an aqueous sodium-containing solution intermediate the combustion chamber and the mixing unit, means for sifting or sizing the mixture of ash, reaction product, and unreacted SO<sub>2</sub> sorbent disposed intermediate the combustion chamber and the mixing unit, means for drying the ash, the reaction product, and the hydration product disposed intermediate the mixing unit and the combustion chamber, an intermediate store for the storage of the ash, the reaction product, and the hydration product disposed intermediate the means for drying and the combustion chamber, the mixing unit includes at least one nozzle for the supplying of the water or aqueous sodium-containing solution. Chughati et al teaches means for supplying water or for an aqueous sodium-containing solution intermediate the combustion chamber and the mixing unit, means for sifting or sizing the mixture of ash (14, fig. 1), reaction product, and unreacted SO<sub>2</sub> sorbent disposed intermediate the combustion chamber and the mixing unit (11, fig. 1), means for drying the ash, the reaction product, and the hydration product disposed intermediate the mixing unit and the combustion chamber (17, fig. 1), an intermediate store for the storage of the ash, the reaction product, and the hydration product disposed intermediate the means for drying and the combustion chamber (22, fig. 1), the mixing unit includes at least one nozzle for the supplying of the water or aqueous sodium-containing solution (col. 2, line 32) for the purpose of obtaining a greater degree of purification. It would have been obvious to one of ordinary skill in the art to modify Shearer et al by including means for supplying water or for an aqueous sodium-

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containing solution intermediate the combustion chamber and the mixing unit, means for sifting or sizing the mixture of ash, reaction product, and unreacted SO<sub>2</sub> sorbent disposed intermediate the combustion chamber and the mixing unit, means for drying the ash, the reaction product, and the hydration product disposed intermediate the mixing unit and the combustion chamber, an intermediate store for the storage of the ash, the reaction product, and the hydration product disposed intermediate the means for drying and the combustion chamber, the mixing unit includes at least one nozzle for the supplying of the water or aqueous sodium-containing solution as taught by Chughati et al for the purpose of obtaining a greater degree of purification so that the apparatus operates more efficiently.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shearer in view of Kobayashi et al. Shearer discloses Apparatus for the cleaning of flue gases containing ash and sulfur dioxide produced by burning sulfur-containing coal in the combustion chamber of a circulating fluidized-bed firing system by the addition of air at a temperature of 700 to 950C (50, fig. 1), the apparatus comprising: means for delivering a particulate SO<sub>2</sub> sorbent into the combustion chamber (52, fig. 1), a portion of the SO<sub>2</sub> sorbent and SO<sub>2</sub> producing a reaction product, a portion of the SO<sub>2</sub> sorbent remaining unreacted (col. 4, lines 57-61); a mixing unit (60, fig. 1),; means for feeding a mixture comprising a portion of the ash, a portion of the reaction product, and a portion of the unreacted SO<sub>2</sub> sorbent from the combustion chamber to the mixing unit (61, fig. 1); means for supplying water or an aqueous sodium-containing solution to the mixing unit (63, fig. 1), the water or aqueous sodium-containing solution mixing together with the mixture of ash, reaction product, and unreacted SO<sub>2</sub> sorbent at a reaction temperature of 60 to 100 and at atmospheric pressure, whereby the unreacted SO<sub>2</sub> sorbent is converted into a

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hydration product (col. 5. line 47); and means for returning the ash, the reaction product, and the hydration product from the mixing unit into the combustion chamber; wherein in the combustion chamber the hydration product is reactivated into an SO<sub>2</sub> sorbent at a combustion temperature of 700 to 950 C (67, 68, fig. 1, col. 3, line 60). Shearer et al discloses applicant's invention substantially as claimed with the exception of means for grinding the mixture of ash, reaction product, and unreacted SO<sub>2</sub> sorbent disposed intermediate the combustion chamber and the mixing unit. Kobayashi et al teaches means for grinding the mixture of ash, reaction product, and unreacted SO<sub>2</sub> sorbent disposed intermediate the combustion chamber and the mixing unit (2, fig. 2) for the purpose of improving the agglomeration effect. It would have been obvious to one of ordinary skill in the art to modify Shearer et al by including means for grinding the mixture of ash, reaction product, and unreacted SO<sub>2</sub> sorbent disposed intermediate the combustion chamber and the mixing unit as taught by Kobayashi et al for the purpose of improving the agglomeration effect and thus improving desulphurization efficiency.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shearer. Shearer discloses Apparatus for the cleaning of flue gases containing ash and sulfur dioxide produced by burning sulfur-containing coal in the combustion chamber of a circulating fluidized-bed firing system by the addition of air at a temperature of 700 to 950C (50, fig. 1), the apparatus comprising: means for delivering a particulate SO<sub>2</sub> sorbent into the combustion chamber (52, fig. 1), a portion of the SO<sub>2</sub> sorbent and SO<sub>2</sub> producing a reaction product, a portion of the SO<sub>2</sub> sorbent remaining unreacted (col. 4, lines 57-61); a mixing unit (60, fig. 1),; means for feeding a mixture comprising a portion of the ash , a portion of the reaction product, and a portion of the unreacted SO<sub>2</sub> sorbent from the combustion chamber to the mixing unit (61, fig. 1); means for

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supplying water or an aqueous sodium-containing solution to the mixing unit (63, fig. 1), the water or aqueous sodium-containing solution mixing together with the mixture of ash, reaction product, and unreacted SO<sub>2</sub> sorbent at a reaction temperature of 60 to 100 and at atmospheric pressure, whereby the unreacted SO<sub>2</sub> sorbent is converted into a hydration product (col. 5, line 47); and means for returning the ash, the reaction product, and the hydration product from the mixing unit into the combustion chamber; wherein in the combustion chamber the hydration product is reactivated into an SO<sub>2</sub> sorbent at a combustion temperature of 700 to 950 C (67, 68, fig. 1, col. 3, line 60). Shearer et al discloses applicant's invention substantially as claimed with the exception of mixing unit is selected from the group consisting of a plowshare, a paddle mixer and an agitator. At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to have mixing unit is selected from the group consisting of a plowshare, a paddle mixer and an agitator because Applicant has not disclosed that the type of mixer provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with either the mixer of Shearer et al or the claimed mixer because both mixers perform the same function of mixing equally well.

#### ***Allowable Subject Matter***

Claims 3-5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***



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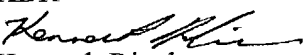
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Staudinger (4590049), Rochelle et al (4931264), Flytzani-Stephanopoulos (5538703), Kuivalainen et al (6290921), Madden et al (5795548), Madden et al (5814288), Brannstrom (5544596).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth B Rinehart whose telephone number is 703-308-1722. The examiner can normally be reached on 7:30-4:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ira Lazarus can be reached on 703-308-1935. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KBR

  
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Patent Examiner  
AU 3749

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